VOCATIONAL REHABILITATION OF THE DIFFERENTLY ABLED

Dissertation

Submitted in partial fulfillment of

Requirements for the degree of

M.D DEGREE EXAMINATION

BRANCH - PHYSICAL MEDICINE AND REHABILITATION

MADRAS MEDICAL COLLEGE

AND

GOVERNMENT GENERAL HOSPITAL

CHENNAI – 600 003

THE TAMIL NADU DR.M.G.R MEDICAL UNIVERSITY

CHENNAI – 600 032

JUNE 2011

DECLARATION

I solemnly declare that the dissertation titled "VOCATIONAL REHABILITATION OF THE DIFFERENTLY ABLED" is done by me at Chennai. The dissertation is submitted to The Tamilnadu Dr. M.G.R. Medical University towards the partial fulfillment of requirements for the award of M.D. Degree in PHYSICAL MEDICINE AND REHABILITATION. I also declare that this dissertation has not formed the basis of the award of any other degree or diploma of any university.

Dr. S.SUNDER

Postgraduate in physical medicine and Rehabilitation

Place: Chennai

Date: 17.06.2011

ACKNOWLEDGEMENTS

This is a work of dedication to the differently abled population. I am deeply indebted to late Mr. Malegamvala of the Lady Tata Memorial trust, who accepted my project for the Lady Tata Fellowship when I was a student of Physical medicine, Dr.K.Janardanam and Dr.C.Ravindranath of the Govt. Institute of Rehabilitation medicine K.K.Nagar Chennai who helped me through the initial phases of the study the staff of GIRM who helped me, and the amputees who cooperated with me.

For the study of aptitude in the disabled, I thank Mrs.Usha Bharadwaj who was of immense help in executing the second project of assessing musical aptitude. My thanks are due to Mr.T.S.Subramaniam, Mr.Hariharan, and many others of the Freedom trust in encouraging this concept. I thank Mr.Ramsuresh, art teacher and all other teachers for having produced three outstanding national award winning artistes through Freedom trust.

CONTENTS

VOCATIONAL REHABILITATION OF THE DIFFERENTLY ABLED

"There are so many opportunities in life, that the loss of two or three capabilities is not necessarily debilitating. A handicap can give you the opportunity to focus more on art, writing, or music." Jim Davis (American Actor. 1915-1981)

INTRODUCTION AND DISCUSSION

Sociovocational rehabilitation is one of the important phases of rehabilitation, offered along with or as a sequence to medical rehabilitation. It is a team effort, which provides the disabled or differently abled person a vocation, a barrier free home, and the right social environment to minimize his handicap. Today, instead of treating vocational rehabilitation as a welfare measure, legislation is recognizing among the handicapped the concept of the **'right to work'.**

From the late middle ages to the 19th century, work was an attribute of low social status. It was beneath ones dignity to work, and menial jobs were delegated to the lower peasantry, a concept that is still sometimes practiced. The nobility never worked. Most of the upper class gentry spent time in hunting, gaming or in political manipulations. After the industrial age, and when the world returned to a more social order, the tendency is to treat work as much more than a means to money, but as **a way of living and a mode of dignity to the individual**. It is thus an outlet for his aspirations, and adds to his self esteem as an independent contributor to society.

Nowadays a job reflects ones identity in the community, his social status and feeling of self worth. The financial aspects of the job, too, are very important and directly linked to his or her quality of life. A job or a profession empowers a person—not just economically but in a more basic and meaningful sense. It makes him stand on his own legs. **It does not bind him, it sets him free.** Obviously not every handicapped individual can stand on his own feet - literally or otherwise. A more realistic and pragmatic approach to each case is needed.

In a country like ours where even the able bodied do not get work, questions are naturally raised as to why does the Person With Disability [PWD] need to work? Why do there have to be so many professionals involved in getting him employed? What are the tangible and intangible returns? However we must not forget is that **it is the constitutional right of every citizen to be gainfully employed by mainstreaming himself into society**.

Employers must be encouraged to use the services of the PWD with incentives being given by the State in the form of tax benefits, awards and social distinctions. Towards this direction, laws have been passed to give the differently abled their rightful place in society. The passing of the Americans with Disabilities Act [ADA] in 1991 was a landmark in the life of the disabled in that country. In India the act passed is the **PWD (People with Disabilities) Act 1995.**

DEFINITIONS[1]

Disabled Person: An individual whose prospects of securing and retaining suitable employment are substantially reduced as a result of physical or mental impairment

Disability discrimination is the act of treating someone with a disability less favorably than someone without a disability.

Disability Rating rates the patient's inability to do an activity compared to what he was able to do before the problem.

Functional Capacity Evaluation (FCE) means the systematic process of assessing an individual's physical capacities and functional abilities and matching human performance levels to the demands of a specific job or work activity or occupation.

Job placement means services provided to support the disabled covered employee's search for work including, but not limited to, identifying job leads, arranging interviews, teaching techniques for effective job searches, resume writing, interviewing and job application completion

Vocational testing means standardized interest, aptitude, achievement, and other specific skills tests used to identify areas of interest and aptitudes for various types of work, and compatibilities with different work environments.

VOCATIONAL REHABILITATION

is a process that helps a disabled individual with any impairment to overcome his or her handicap, and using the residual physical and intellectual capacities, try to reintegrate them into society by providing a job or vocation. Vocational rehabilitation is a long standing process that can take many forms.

VOCATIONAL REHABILITATION TEAM

The members of the rehabilitation team are the vocational counselor, the trainer and the placement officer. Whatever principles of vocational counseling are applicable to the disabled are equally applicable to normal people.

Vocational Counselor

The counselor is one who offers time, attention and respect to another person who is temporarily in the role of a client. The key factor is that though he provides most of the information and options, he does not take part in the decision which ultimately rests with the client. He or she must be empathetic enough to share the client's views, listen carefully to them, match the client in speed of thought, sometimes tolerating their idiosyncrasies.

The counselor evaluates the patient, first by taking up an inventory check list in which the patient fills in a questionnaire relating to various qualitative and quantitative aspects. Then he observes the patient and interacts with him extracting the socio vocational, educational and avocational history. There must be excellent rapport and trust between patient and counselor. The client passes through psychological, Psychiatric and Cognitive Evaluation, in addition to

evaluation of interests, aptitudes, skills and physical functions, especially those of the hand.

Sometimes the impression is given that guidance and counseling are synonymous. This is not true. Providing information about a career, group work, vocational testing, occupational placement, may all come under vocational rehabilitation but do not involve counseling.

The counselor will discuss the priorities and aspirations of the individual during the interview. He also co-ordinates with the physiatrist, the occupational therapist and skilled trainers to improve upon the residual abilities of the patient.

He evaluates job related interests, aptitudes, and skills, and counsels patients who contemplate shifting to alternate occupations and activities. He counsels patients to improve job-related behavior (i.e., how to face an interview, how to demonstrate work skills, and how to improve employer-employee relationship). He must arrange for the client to get a job trial so that he or she has a clear grasp of career and hierarchies. He is the nodal point of contact between skilled trainers, placement officers, employers and the patient. The vocational counselor also speaks to potential employers, trying to understand the nature of the job the promotion aspects and the scope of placement.

Chart 1

Psychological tests frequently used in work assessment[2]

Category	Name
Achievement and reading	Adult Basic Learning Examination Gray Oral reading Test Peabody Individual Achievement Test Test of Adult Basic Education
Personality	Minnesota Multi phasic Personality Inventory Draw-a-Person Test
Intelligence	Wechsler Adult Intelligence Scale Peabody Picture Vocabulary Test
Vocational Aptitudes	General Aptitude Test Battery Non-reading Aptitude Test Battery Stromberg Dexterity Test
Vocational Interests	Picture Interest Inventory
	Importance Questionnaire
	Occupational Interest Survey Wide Range Interest-Opinion Test

If you're an underdog, mentally disabled, physically disabled, if you don't fit in, if you're not as pretty as the others, you can still be a hero. ~ Steve Guttenberg

Ability

It is the innate capacity and potential for performance and relates mainly to the speed of acquisition of a new skill. Ability may be **general or special**.

The **General Aptitude Test Battery (GATB)**[3] tests the individual on principal components of ability that are generally considered important in training or retraining a person back to work. Commonly tested abilities are **intelligence or general learning ability, verbal aptitude, numerical proficiency, spatial aptitude, form perception and clerical perception** which is the ability to spot details in tabular and data based material, motor co-ordination, and dexterity.

Aptitude

It is the special ability or talent in different areas like verbal, numerical, spatial etc. Some people are extremely talented in music dance or art which makes them ideal members for training in those specific areas.

Skill

It is a trained proficiency that is needed for ones vocational pattern. It is achieved by repetitive actions till the person reaches a level of performance. The PWD can thus become a skilled IT professional, musician or cobbler after years of working in the field. Naturally, skills can be trained faster if one has the aptitude and it takes much less effort on the part of the teacher or the student to achieve a high level of proficiency.

Interest

We all know that Interest is one's own preference or a thing one likes. In some things as important as a career, it is difficult to judge where ones interests lie. Behind all the grease paint that an actor dons, there are a lot of retakes, scripts to memorize and emotional turmoil. The only way to find out if one is interested is to get a lot of exposure in the formative years. When one's interests, aptitudes and skills coincide, the job satisfaction and output is optimal.

Scope

Unfortunately many vocational counselors look at the scope of the profession first. This is also where there is so much unsolicited advice. In many families there is a family business to fall back on when we need to place the individual.

THE DISABLED HAND

Hand disabilities may be through pathology to bone, muscle, joints, nerve, skin (or a combination of these) or through a neurological problem like hemiplegia or a rheumatological disease like rheumatoid arthritis.

The finer the hand control needed, the more difficult the vocational rehabilitation may become because of the complexity of functions, and skills needed for a job and for daily life. Power, precision, prehension and sensory evaluation are all tested.

Physical Capacity Evaluation

Tests like the Smith Physical Capacity Evaluation[4] are found to be very accurate in predicting reemployment of workers with physical disabilities. Sensory reeducation may be remedial or compensatory and would be useful to improve function in a worker with sensory impairment.

Hand and Pinch Strength Testing

The patient is asked to grip a dynamometer and the calibration is read out of the dial. The highest reading is taken until reset manually. Pinch strength is measured by a pinch gauge.

Endurance Testing: in some conditions like muscular dystrophy, patients lack the requisite endurance which is needed for sustained activity.

MEDICAL REHABILITATION

Suitable positioning, splinting and simple exercises are practiced on the patient by the occupational therapist. This would prevent long term complications like deformities and contractures. The patient with rheumatoid arthritis is shown positions to avoid which may lead to excessive trauma or to deformity. The patient with a nerve injury is warned of the dangers of burns or trophic ulcers to the insensitive areas in the leg or hand.

"It is a lonely existence to be a child with a disability which no-one can see or understand, you exasperate your teachers, you disappoint your parents, and worst of all you know that you are not just stupid." - Susan Hampshire

Skilled Trainer

Once the vocation has been identified, to impart training to these individuals there are “skilled trainers” who are experts in their own fields. They are employed sometimes by NGO’s who offer courses for the people with disability to get trained in various skills. Common vocations that are taught include carpentry, data entry, tailoring, lathe work, press composing, book binding, operating Xerox machines, block printing, screen printing, greeting cards manufacture, and other small scale operations. The course may lead to a certificate or degree or diploma which may be recognized by a university. The organization may also absorb some of the individuals as a form of sheltered workshop.

Some candidates who are motivated and independent may opt for self-employment. Bank loans are also available and he may be able to start off on his own. Some of the trainers may have disability themselves, who help motivate the ‘students’. The training need not be ‘hands on’ all the time, but include playtime and leisure activities which may later come in handy for job training. There is no specific age to start a training course, since for the arts the training can start as early as three years of age.

Placement Officer

In the social welfare section of the institution, or very often in Government employment exchanges, there is a Placement officer who liaises with the industry and commercial circles. Occasionally the Government announces vacancies for positions earmarked for the differently abled as and when they arise. The officer

will get in touch with the vocational evaluator, the social worker, skilled trainer and counselor and match the jobs to the candidates according to seniority, proficiency, nearness from their home to the industry, aptitude, communication and mental skills required for that job.

In a vast country with a paucity of professionals, many of these roles- counselor, evaluator, skilled trainer, placement officer may not be available in a single institution, or even in a single city. The same person doubles up for several of these roles. Some non-governmental institutions complement each other, using each others strengths, to get the process of vocational rehabilitation going. In rural and semi rural areas where trained professionals may not be available a single person may do all the roles combined.

Job placement is not the end; sustaining it is equally important. Modification of the environment to suit the individual is necessary. For example, ramps have to be constructed to accommodate wheelchairs, toilets have to be modified, equipment of daily use has to be redesigned and manufactured. It is only in this manner that the disabled person is made “differently abled.”

“Congress acknowledged that society's accumulated myths and fears about disability and disease are as handicapping as are the physical limitations that flow from actual impairment.” - William J. Brennan, Jr.

THE MAGNITUDE OF THE PROBLEM

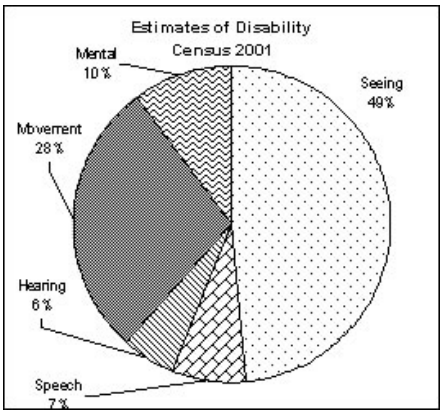
According to various estimates, about 5 to 10 percent of the world's population is affected by one or more disabilities. There are 600 million disabled people worldwide, 370 million in Asia alone[5]. Nearly 386 million of these are of working-age which makes them a huge chunk of the general population [238 million in Asia] with large scale urbanization many move into cities leaving the handicapped persons back in the villages, which is why most of the handicapped live in rural areas.

Unemployment rates are double that of the general population and as high as 80 percent of the disabled population have no work. This obviously has a great impact on the rampant poverty in the villages which proves that disability and poverty are linked. A state that cares for its disabled is indeed economically stronger. However the socioeconomic costs are high, as the costs for training the handicapped persons is high.

This is not to say that handicapped people are unemployable. Far from it. There are many studies which have proved that PWD are capable and talented and can work and perform on par with their peers[6] because they don't generally aspire to greater heights and have limitations in their mobility, there is greater job retention.

THE INDIAN SCENARIO

In our country (with a population of over 100 crores now) the National Sample[7] Survey 2001 has estimated that about 2.19 crores or nearly two percent of the population, experience difficulty in walking or using their limbs, or suffer from visual, hearing or mental impairment. Since over 70 percent of our population is in rural areas, the number of those with less severe disability could be much larger. Also the extent of disability and handicap is quite variable in the minds of several people, and what construes disability to one person seems perfectly normal to another.



Seventy five per cent of persons with disabilities live in rural areas, 49 per cent of disabled population is literate and only 34 per cent are employed. The earlier emphasis on medical rehabilitation has now been supplemented by an emphasis on social rehabilitation.

LEGISLATION - VOCATIONAL REHABILITATION AND EMPLOYMENT POLICIES FOR DISABLED PERSONS

Over the years there has been legislation at the international and state levels and policies have been adopted over Vocational rehabilitative measures.

- *1955* ILO VR Recommendation No. 99
- *1971* UN Declaration on the Rights of Mentally Retarded Persons
- *1975* UN Declaration on the Rights of Disabled Persons

- *1981* UN International Year of Disabled Persons
- *1982* UN World Program of Action Concerning Disabled Persons
- *1983-1992* UN Decade of Disabled Persons
- *1983* ILO VR (Disabled) Convention No. 159
- *1983* ILO VR (Disabled) Recommendation No. 168
- *1993* UN Standard Rules on the Equalization of Opportunities for Persons with Disabilities
- *1993-2002* Asian and Pacific Decade of Disabled Persons

THE PERSONS WITH DISABILITIES (PWD) BILL, 1995[8]

(Equal Opportunities, Protection of Rights and Full Participation)

India is a sovereign socialist democratic republic with a federal structure and an estimated population of over 100 crores. It is enshrined in the Constitution of India that there shall be equal opportunity for citizens of India, and protection of their rights.

Purpose of the Bill

The purpose of the Bill which was made law in 1996[9] is to fix responsibilities on the Central and State Governments to the extent of their resources, to provide services, create facilities, and give support to people with disabilities in order to enable them to have equal opportunities in participating as productive and contributing citizens of this country to the fullest extent of their abilities.

PROJECT 1

VOCATIONAL REHABILITATION OF UPPER EXTREMITY AMPUTEES BACK TO THEIR PROFESSIONS

"Some people are always grumbling because roses have thorns; I am thankful that thorns have roses." - Alphonse Karr

VOCATIONAL REHABILITATION OF UPPER EXTREMITY AMPUTEES BACK TO THEIR PROFESSIONS

Introduction: The upper limb has always posed a major challenge for prosthetics. Developments in power and control are the challenges of modern upper extremity prostheses. Myoelectric prosthetic controls are now used for transhumeral and transradial amputations, but are unwieldy, costly and cannot be used for heavy duty work. Fitting an upper limb amputee with a prosthesis is a time consuming process. The patient must also be involved in the decision making process so that he can choose the limb that suits him best.

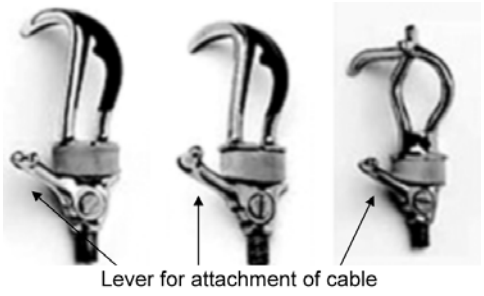
It must be explained to the patient that mere assembling and fitting prosthesis cannot replace the multifarious activities that a hand can perform. The patient is generally keen to get back to his original job. In certain bimanual gross motor activities related to the profession, there is no way the existing hooks and hands can replace the function.

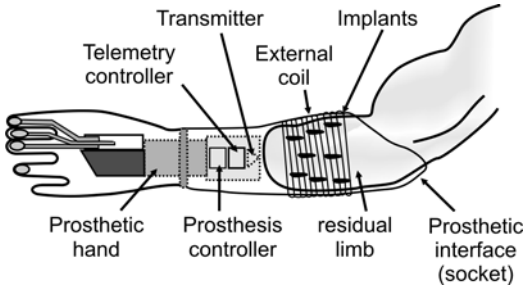
This project is an effort to make customized terminal devices to the upper limb amputees to enable them to get back to their original professions.

"Each handicap is like a hurdle in a steeplechase, and when you ride up to it, if you throw your heart over, the horse will go along, too." - Lawrence Bixby

TERMINAL DEVICES

The functional or mechanical hand can be attached to the wrist unit of most upper extremity prosthesis and is operated by cable control. It consists of a spring-controlled device with plastic fingers that are controlled by the control cable of prosthesis. Only the thumb index and middle finger participate in the pinch; known as the *3-jaw chuck pinch.*





Courtesy: Textbook of Rehabilitation medicine. Dr.Sunder 2009

Dorrance Hooks

The voluntary opening (VO) device is maintained in the closed position by rubber bands or tension springs, which determine maximum prehensile force possible.

Myoelectric Prosthesis

Myoelectric prosthesis uses signals from the neuromuscular system to activate specific component functions. Combinations of conventional and myoelectric components may be considered within the same prosthesis.

Modus operandi:

The project involves the fitment of the tools of the professions followed by each of the patients prior to their amputations. All the jobs screened were bimanual that is using both hands at least one of which would be grasping a tool. Due to the limitations of the regular prosthesis fit for the upper limbs it was advisable to take a detailed vocational history and fit the prosthesis keeping in mind the ultimate job.

The following professions were taken into consideration.

Grass cutting	Tea master
Hair cutting	Stone breaking
Masonry	Flour mill worker
Driving	Press composing

Advantages

The advantage of this approach is that the patient need not be trained in any specific profession because he already possesses the skills needed. Secondly he can go back to the village where he came from and start afresh from where he left off. There would be no need for fresh investments, new contacts or advanced training. Another highlight of this project was **the use of appropriate technology without very costly components**. The modifications to the prosthesis were custom made but easily replicable and cheap.

Disability is a matter of perception. If you can do just one thing well, you're needed by someone. Martina Navratilova

Case 1

Name: **Ramakrishnan** Age: 35/Male

Disability: Left elbow disarticulation

Occupation: Hair dresser

Discussion: Ramakrishnan is a hair dresser from Trichi. He was on a trip to Ahmedabad and fell from a moving train. The left upper limb was disarticulated at the elbow. Initially he was given mechanical voluntary opening Dorrance hook, but he was unable to grip the comb. Since the amputation had occurred in the elbow he had to be fitted with an elbow unit and a Bowden cable system which made the process of hair cutting very difficult. The patient rejected the original terminal device because it could not hold the comb at the right angle for cutting the hair. Since he was right handed and needed to hold the scissors in his normal right hand it was easier to modify the tool of the trade for him. He needed to hold a comb in his left hand by which he used to comb the hair of the client while cutting it with his normal right hand.

Details of device modified: An ordinary comb was fixed to an aluminium spatula and screwed on to the wrist unit. The other end of the spatula was covered with foam liner to help while shaving.

Time for training: The occupational therapist trained him to unscrew his cosmetic hand and fix this modified terminal device. Training was given for four hours

Job trial-The job was conducted in June 89 at Madras on a volunteer, and Ramakrishnan was asked to perform a hair cut and a shave.

Conclusion: He was able to perform a hair cut in 22 minutes and shave in ten minutes


The specially made appliance (L) and Ramakrishnan fitted with the appliance(R)


Ramakrishnan performing the hair cut (L) and poses with his client after the hair cut(R)

"Not everything that is faced can be changed, but nothing can be changed until it is faced." - James Baldwin

Case 2

Name: **V. Subbiah**

Age: 49/Male

Disability: Right mutilated hand

Occupation: Driver

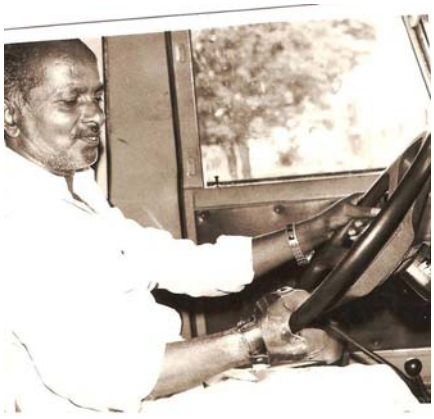
Discussion: Subbiah sustained an accident while he was driving a vehicle. His hand was mutilated and reconstructed through plastic surgery. The thumb and little finger were retained affording a pincer like grip. The opponens pollicis and opponens digiti minimi were retained and he was able to pick up a few objects using his grip. Unfortunately he was unable to drive the vehicle because the steering wheel did not fit on his palm. A cosmetic hand was fit to his extremity, which was unable to perform the activities needed for driving. The original terminal device (cosmetic hand) was discarded for this reason. A detailed description of his professional requirements was taken and it was found that he had a poor grip of steering wheel with adductor and opponens of thumb.

Details of device modified: A suede leather device with padding over the thenar & hypothenar eminence was fastened with Velcro straps over his wrist and using his claw grip he was able to hold the steering wheel with a fair amount of power. He was fortunate that the left hand was intact so that he could change gears normally and this device needed to hold the steering wheel only while the gears were being changed.

Job trial- In July 89, a job trial was conducted in Madras and Subbiah was made to drive a jeep. The safety aspect was also taken into consideration and he was made to negotiate the vehicle in heavy traffic. The patient also expressed the desire to change tyres and this was also accomplished after a period of training of two hours.

Conclusion: He was able to negotiate the vehicle in heavy traffic and was able to change tyres.

The specially made appliance (L) and Subbiah fitted with the appliance(R)



Subbiah changing the tyre (L) and is seen driving the jeep with the appliance fitted (R)

"I discovered early that the hardest thing to overcome is not a physical disability but the mental condition which it induces. Alexander de Seversky

Case 3

Name: Periyasamy

Age: 35/Male

Disability Right below elbow amputee

Occupation: Mason

Discussion Periasamy a right below amputee had lost his hand after sustaining a fracture which developed into gangrene. He was jobless because he could not perform his duties as a mason. The tool had to be grasped in the right hand and the skills could not be transferred to the left. The job involved breaking bricks, placing them while constructing the wall, mixing cement, sand and water, plastering the wall, applying a plumb line and smoothening the surface of the wall. None of these could be achieved by the Dorrance hook or the mechanical hand that was given. He was given a cosmetic hand and modified spade.

Details of device modified: A spade was fit with screws and fitted to the wrist unit of the prosthesis and Periasamy was made to break a brick and plaster a wall. Suitable materials like cement and sand were provided.

Job trial- In July 89, he was made to mix sand and cement, break bricks. On the next day he was made to plaster the wall after placing the bricks

Time for training: 1 day

Conclusion: He was able to get back to his original profession successfully.

Periyasamy's amputated right hand (L) Periyasamy fitted with the working terminal device(R)

Periyasamy seen breaking a brick and plastering the wall with the fitted appliance

Periyasamy ,mixing sand and cement

"Disability is not a brave struggle or 'courage in the face of adversity.' Disability is an art. It's an ingenious way to live." - Neil Marcus

Case 4

Name: Alagirisamy

Age: 20/Male

Disability: Right below elbow amputee

Occupation: Grass cutter

Discussion: Alagirisamy who hailed from Madurai lost his hand when his dress got entangled in a sugarcane crushing machine. The grossly mutilated hand had to be amputated below elbow. He had no formal education and was dependant on farming and grass cutting for a living. He was provided a Dorrance hook for his ADL's and a cosmetic hand for cosmesis but he expressed his desire to get back to his original job. The job involved cutting grass tying it up in a bundle and carrying it overhead. The tool involved was a sharp sickle knife.

Original cosmetic hand was discarded because he could not grip the sickle. He was unable to vary the cutting angle of the sickle.

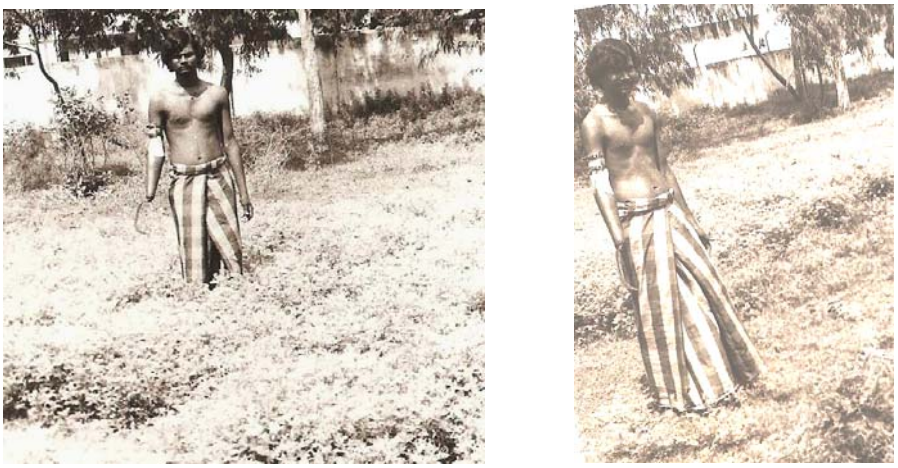
Details of device modified: A sickle was screwed on to the wrist unit and reinforced for strength.

Job trial- was conducted in Aug 89/Madras and Alagirsamy was asked to cut a grass field. He needed to be trained to screw on the sickle and remove it and was given some safety tips.

Time for training: 1 hour

Conclusion: He was able to cut a sizeable quantity of grass in ten minutes and was comfortable with his new fit.

Alagirisamy's amputated right hand (L) fitted with the terminal device



Alagirisamy posing with the sickle fitted hand before grass cutting (L) & after grass cutting(R)

"Not only do physically disabled people have experiences which are not available to the able-bodied, they are in a better position to transcend cultural mythologies about the body, because they cannot do things the able-bodied feel they must do in order to be happy, 'normal,' and sane....If disabled people were truly heard, an explosion of knowledge of the human body and psyche would take place." - Susan Wendell

Case 5

Name: Murugan

Age: 19/Male

Disability: Right elbow disarticulation

Occupation: Press composer

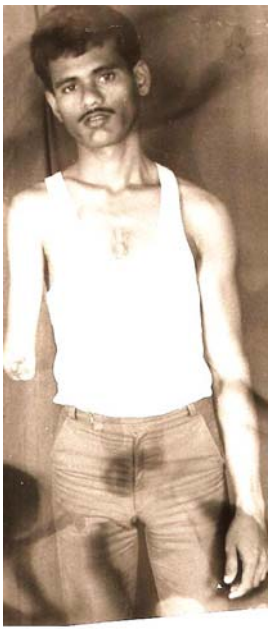
Discussion: Murugan lost his hand in a motor bike accident. When he was examined he was a inmate of the Red cross society, Madras. He had been training in composing letters in a printing press. When he lost his hand he was unable to do place the letters on the composing stick. The job involved placing letters in sequence on a composing stick which would then be transferred on to the panel. He could not hold the composing stick with the mechanical hook or hand.

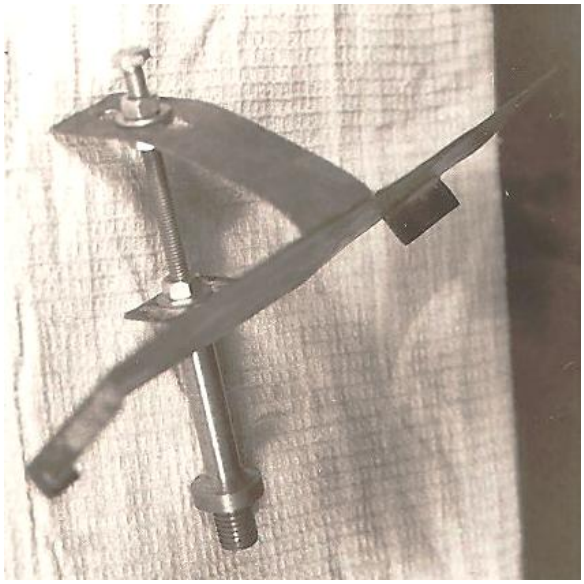
Details of device modified: The aluminium bar (composing stick) with brass rod was screwed on to wrist unit and Murugan was trained to don & doff it. He was made to compose a page using his normal left hand and transferring the letters on to the composing stick in the prosthesis.

Job trial was conducted in -Oct 89/Madras.

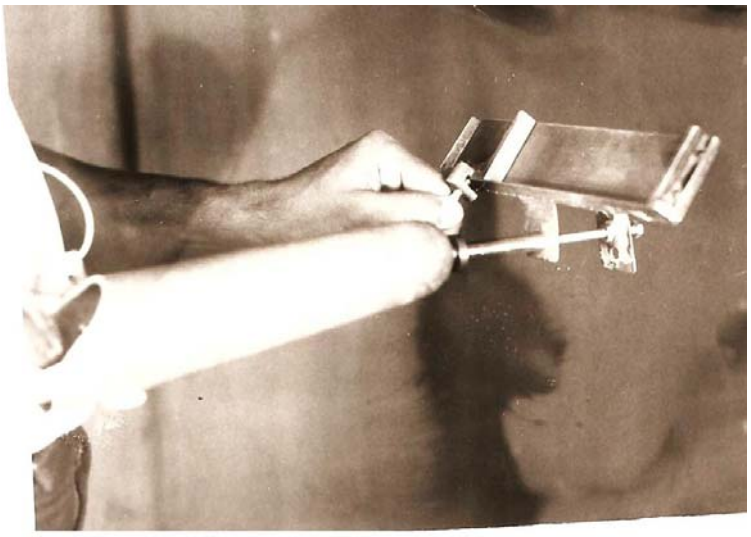
Time for training: 2 weeks

Conclusion: He was able to hold the stick in the device and operate with his left hand and carry on his work with ease.





Murugan's amputated hand (L), his special appliance (R) for press composition



Murugan at his press fitted with the new appliance

"For me, the wheelchair symbolizes disability in a way a cane does not." - Annette Funicello

Case 6

Name: Krishnan

Age: 68/Male

Disability: Right above elbow amputee

Occupation: Tea master

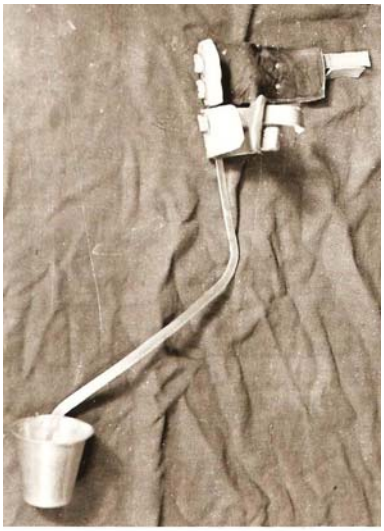
Discussion: Krishnan was a tea master from Kerala, He developed a malignant tumour in his right hand and had to be amputated above the elbow to prevent spread of the malignancy. Fitting a above elbow prosthesis is always a challenge because the elbow unit and the terminal device have to be operated by the individual through the cable systems which makes it unable to perform fine motor movements.

He was unable to hold the glass with which he had to mix the tea. A job analysis was done and it was found that Krishnan had to hold the glass in one hand and a aluminium mug in the other and mix the tea by pouring it from one vessel to the other

Details of device modified: A long aluminium rod fastened with a leather socket and bent at elbow level attached distally to an aluminium tumbler was fit to Krishnan and a job trial was conducted.

A **job trial** was conducted in -April 90/Madras, and Krishnan was made to pour water from one cup to the other.

Conclusion: He was trained for two days however since he had to perform other functions to make the tea and also because the job involved pouring hot water it was decided that the modified prosthesis though functional would not be safe enough for him. He was discharged with a mechanical hand.



Krishnan fitted with the appliance (L) the specially made appliance (R)

Krishnan trying to performing his task with the fitted appliance

The only disability in life is a bad attitude.

Scott Hamilton

Case 7

Name: Dharmalingam

Age: 27/Male

Disability: Left wrist disarticulation

Occupation: rice milling operator

Discussion: Dharmalingam worked in a rice mill. The job analysis revealed that he had to collect the rice powder in a vessel and transfer it to a bigger container placed in another part of the room. Usually he performed this with a spatula with which he collected the rice powder into the container. Being a right hander he used to hold the spatula in the right and the vessel in his left. In the job trial the spatula was fixed to the left wrist and a transfer of skill was done so that he held the vessel in his right and used the spatula with his left hand. Since the rice flour was usually very hot the material of the spatula was adapted to withstand high temperatures.

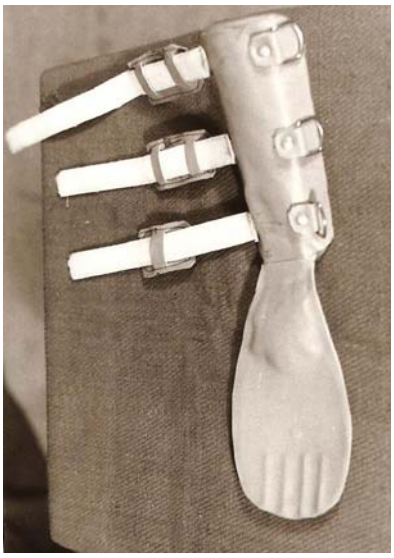
A routine below elbow prosthesis could not be given since it was a disarticulation of the wrist. A cosmetic glove interchanged with the spatula was given.

Details of device modified: Aluminium spatula covered with rexin fitted on to a leather socket, Velcro straps was given.

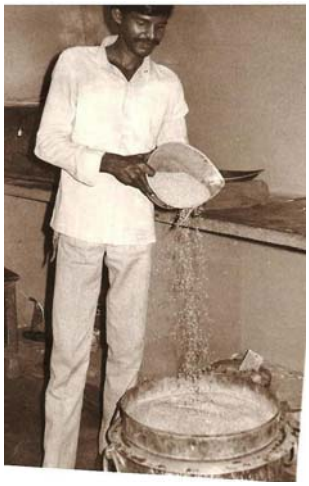
A **Job trial** was done in June 90 and Dharmalingam was made to transfer rice powder and transport it to a near by container.

Time for training: 15 minutes

Conclusion: Was able to collect pounded hot rice into a basket and transport to another room.



Dharmalingam's special appliance (L) appliance being fitted to the amputated hand (R)



Dharmalingam working with ease with his new terminal device

"One always overcompensates for disabilities. I'm thinking of having my entire body surgically removed." - Douglas Adams

Case 8

Name: Periyasamy

Age: 35/Male

Disability: Below elbow left amputee

Occupation: Grass cutter

Discussion: Periasamy a right handed farmer who used to cut grass for a living came to us for limb fitting. Neither the mechanical hand nor the hook could grip the tool of his trade namely the sickle. The job analysis involved holding the garss with the normal hand and cutting it with the device.

Details of device modified: Sickle screwed on to the wrist unit of the prosthesis of the left stump. A job trial was done in June 90, Madras as in the previous case the **transfer of skill from the right hand to the left hand** and vice versa had to be done. This took longer for Periasamy to adapt. However since he was motivated he was able to cut a fair amount of grass in a short while. Advice was given to use the device carefully without injury to self.

Time for training: 1 day

Conclusion: Was able to cut grass with the modified terminal device.

Periyasamy posing with his new hand (L), cutting grass(R) with ease

Case 9

Name: Elumalai

Age: 25/Male

Disability: Below elbow left amputee

Occupation: Stone breaker

Discussion: The stone breakers from Pallavaram region are prone to this sort of occupation hazard. Their families live in and around the quarries of Pallavaram. The stone is quarried from the side of the mountain by placing explosives in holes chiselled into the stone. Some of these shells which are made of metal do not explode and are sold as scrap. Children of stone breakers wait for an unexploded shell and run to the hole when it does not explode. Unfortunately it explodes in their hands mutilating it for life.

Elumalai was one such child who had lost his left hand when a shell exploded and had to be amputated below elbow. He had no choice but to continue in the same job of his family of breaking stones. The job analysis involved holding the chisel in the left hand while he broke stones by hammering it with a hammer on the right.

Details of device modified: A long clamp for holding the chisel was directly attached to the resin socket on the left stump. Elumalai was asked to place the chisel on the stone and hammer it with a hammer on the right.

A job **trial** was done in July 90, ,Madras in which Elumalai was made to break the stones.

Time for training: 1 hour

Conclusion: He was able to break stone with the hammer in the right hand. The chisel kept slipping out. It was reinforced with two more screws.

Elumalai's amputated hand (L), the newly designed appliance (R)

Elumalai fitted with the terminal device (L), breaking stones with the new terminal device

I choose not to place "DIS", in my ability.
Robert M. Hensel

Case 10

Name: Perumal

Age: 66/Male

Disability: Right below elbow amputee

Occupation: Stone breaker

Discussion: Perumal belonged to the same group of stone breakers from Pallavaram. The cause for the amputation was the same as in the case of Elumalai. However the difference was he was amputated in the right. Another significant difference between Elumalai and the other amputees was that **Perumal had fashioned out a socket with a hammer indigenously and was breaking stones with it, even before approaching us for a prosthesis.**

Details of device modified: A leather socket fabricated to a hammer head riveted to it was fitted to the right stump.

A job trial was done in July 90, Madras and since Perumal was anyway using a modified terminal device it took him very little time to get back to his job.

Time for training: 1 hour

Conclusion: Was able to break stones very well

"I was slightly brain damaged at birth, and I want people like me to see that they shouldn't let a disability get in the way. I want to raise awareness - I want to turn my disability into ability." - Susan Boyle

Perumal's amputed hand (L), the new appliance fitted with hammer

Perumal at work with his mechanical hand

"For me, disability is a way of getting some extremity, some kind of very difficult situation, that throws an interesting light on people." - Mark Haddon

APTITUDE – DISABLED OR DIFFERENTLY ABLED?

Introduction:

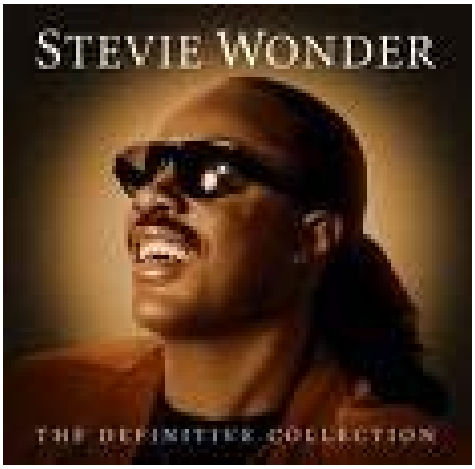
It has been known for ages that people deprived of their eyes, or any of the five primary senses, compensate by enhancing their remaining senses. It is common knowledge that we see a lot of visually impaired people performing in public places. In India and often throughout the world, we see blind beggars on the platforms of railway stations or the road performing. This leads us to the question: ***Do blind children have special musical abilities that in some way compensate for their poor vision or lack of sight?***

There have been many studies that have examined touch and simple auditory perception in the blind, but is there a the neural basis of musical ability in this group? Certain theories of neural plasticity have been proposed which have been hard to empirically assess.

Special ability or aptitude is thought of as a blessing; some have it, others do not. Most aptitudes are normally distributed in the population. With reference to music, some have high aptitude, some almost none at all, and the majority of persons fall somewhere in the middle of the "bell curve".

Among partially sighted children or those who become blind after the first few years of life, musical aptitude is generally at par with the rest but among those who are born blind or who lose their sight early in life, musical talent is often substantially different from normal. Visually impaired children are more likely

than fully sighted children to have a strong interest in music, according to research from the Institute of Education and the Royal National Institute for the Blind (RNIB).



There are many instances of famous singers or music composers who are blind. Italian pop tenor, Andrea Bocelli, who was born with congenital glaucoma is the biggest-selling singer in the history of Classical music, with worldwide sales exceeding 70 million copies. Pop icon Stevie Wonder has won the maximum Grammy awards in its history. In our own country Violin maestro M. Chandrasekaran and Ravindra Jain [music composer] are totally blind. Prof. V.S. Ramachandran eminent Neuro Scientist from California postulates ten components of art as perceived by the brain[10]. Of these the principles of isolation & perceptual problem solving wherein people are able to pick up interesting facets of any art form from among a confusing background are relevant in visually impaired children trained in music.

The Savant syndrome

The term *idiot savant* (French for "learned idiot" or "knowledgeable idiot") was first used to describe the condition in 1887 by John Langdon Down[11]. It is a rare condition described in which people with developmental disorders have one or more areas of expertise, ability, or brilliance that are in contrast with the individual's overall limitations.

Savant Skills *(prodigious savants)*

Memorization - superior memory is a common feature of savant syndrome, but it also can be a special skill in its own right. There are cases of savants who have memorized population statistics, telephone books, and bus schedules.

Lightning calculation - the instantaneous calculation of multiplications, square roots, etc, the determination of prime numbers

Calendar calculating - involving the ability to identify the day of the week upon which a particular date falls, in one case any time in the last, or next, forty thousand years!!

Musical ability - this a relatively common savant skill, the co-occurrence of musical genius, blindness and learning disability Savants will have perfect pitch, and can play a complete piece of music after hearing it only once.

Artistic ability - not as common as musical abilities, but there are savants with exceptional painting, sculpture and especially drawing skills.

Tony Deblois

Tony DeBlois was born blind, mentally retarded, and autistic, but he has so much talent in music that he plays 20 instruments and knows 8,000 songs.

Hikari Oe[12]

Son of Kenzaburo Oe, the winner of the 1994 Nobel Prize for Literature, was born with retardation, autism, near-blindness, and poor coordination, due to a

brain deformity. Yet Hikari has become an accomplished composer of classical music, that are mature and steeped in the Western classical idiom, and which have won him a worldwide following among CD collectors.His IQ is 65, he cannot speak normally and he is prone to epilepsy.

"Blind Tom" — Thomas Greene Bethune

was an internationally recognized musical savant in the United States around the time of the civil war. He was one of the greatest musical prodigies of the age. Blind and mentally handicapped, he was musical genius who played at the White House at age 11, conducted a world tour at age 16, and had a musical repertoire of over 7000 pieces. However he had a vocabulary of less than 100 words and could barely speak. Blind Tom was one of the most wonderful phenomena in musical history.

HIKARI OE

BETHUNE

TONY DEBLOIS

"It was ability that mattered, not disability, which is a word I'm not crazy about using." - Marlee Matlin

OUR EXPERIENCE IN TRAINING VISUALLY IMPAIRED CHILDREN

In 2004, exceptional talent in music was identified among the visually impaired children and in drawing in hearing & speech impaired children. These talented children were selected and were given scholarships & intense training. Blind children were trained in classical Carnatic music and deaf children were trained in the visual arts. Qualified professional trainers in music and art were recruited to go to their institution to train them wherever the children could not be brought for training. In some cases where the parents were able to bring their children to the master, the children were trained at the residence of the teachers. Training was done twice a week except during the vacations. The children continued to go to their respective special schools, so that their academics were not affected. Over the next few years the results were quite spectacular. **Three of these talented children won the Presidents awards for MOST CREATIVE INDIVIDUAL at the national level. These were**

[2005] Vidharte **[2006] Mehtab Alam** **[2010] Suvedha**

"It is a waste of time to be angry about my disability. One has to get on with life and I haven't done badly. People won't have time for you if you are always angry or complaining." –Stephen Hawking

OUR OBSERVATIONS:

Among the visually impaired, our observations were that there was excellent pitch alignment. They showed exemplary concentration skills towards sound. During training there was no eye contact; all cues were auditory, so training methods had to be different. Among the deaf, we found they were very observant to details of color and shade. The trainers reported that the children were doing much better than their “normal’ counterparts. We found an above average progress among these children which stimulated us to do a study on their aptitude

MEASURING MUSIC APTITUDE

Generally when a child is brought to learn music, the teacher asks the child to perform, sing or play and instrument. **This tests only the musical achievement, not the inherent potential.** Some students because of a musical family background or constant practice are absorbed in to music schools while those with high talent are neglected simply because they do not get the exposure or training in music. Music aptitude ideally should be measured with a music aptitude test.

The Child's musical aptitude at birth is inherent, but can fluctuate until about age nine. Beyond this it is not possible to achieve much in music beyond the stabilized music aptitude. A musical aptitude test is nothing but a pretest to measure the individuals' abilities to interpret the sounds used in audio-interface.

It also has to be a validated numerical measure to make comparisons across individuals.

Tests such as the UK's Associated Board of the Royal Schools of Music aural tests, Bentley's Musical Ability tests and software-based tools rely on the participant's understanding of musical terms, Performance Ability or involve singing back a melody, clapping out a rhythm, beating out a meter or even playing an instrument.

The ideal pre-test would be one that tests participants response to sounds which do not rely on their existing musical knowledge or performance ability. One of the simple tests is to distinguish between two sounds of very close frequency. But this tests only one part of music and not the whole musical picture. The ideal test would also test the entire musical potential.

Some tests followed for testing aptitude in Western Music

EDWIN E GORDON's Musical Aptitude Profile (MAP)[13] is one of the well researched aptitude tests which is a comprehensive test of music aptitude ever published. It is a test with seven components: tonal imagery (melody and harmony), rhythm imagery (tempo and meter), and musical sensitivity (phrasing, balance, and style). A questionnaire is taken to find the family background to music and exposure to music.

"I take advantage of every thing I can - age, hair, disability - because my cause is just." - Marjory S. Douglas

Project 2

TEST FOR MUSIC APTITUDE

So what's the big deal? Don't hide your deformity. Wear it like a Purple Heart." – Georgiann Baldino

Test evolved by us for Carnatic music

In the field of Indian classical music the child is brought to the guru who then asks the child to repeat some simple musical phrases, or sing a song. This is thought to be sufficient for him or her to estimate the talent in the child and render the child suitable for further training. The success of the childs performance in front of the master depends on a lot of factors like the parental or family interests, the child's musical background, the mental state in which the child performs in front of the master. More often than not it is the parents interest which forces the guru to accept the 'disciple'.

Dr. Sunder being an accomplished musician himself designed a musical aptitude test, based on the principles dictated by the Western test battery. The following measurables were tested.

Pitch

Stage 1 - a pitch will be played for twenty seconds, then would either be lowered or increased and the children will be asked to identify whether it was higher or lower

Stage 2 – a pitch is played twice for ten seconds each. Immediately afterwards, three tones are played, out of which one tone is at the earlier pitch and the other two are different from the earlier one.[more than two tones]

Stage 3 - a pitch is played twice for ten seconds each. Immediately afterwards, three tones are played, out of which one tone is at the earlier pitch and the other two are at more than one semitone different from the earlier one .

Stage 4 – a pitch of a known frequency is played on an electronic tambura and the candidate is asked to tune another tambura to the pitch of the first one and the frequency is measured again. The deviation from the earlier pitch was noted. For visually impaired children auditory cues are taken to manually change the pitch.

Rhythm:

Stage 1- A tala will be played [four cycles] and repeated randomly as one among three different talas played later and the children will be asked to identify the first tala

Stage 2 - A tala of a known speed is played on an electronic tala meter and the candidate is asked to match another tala meter to the first one and the accuracy is measured. The deviation from the earlier reading is noted. For visually impaired children auditory cues are taken to manually change the speed.

Pitch & Rhythm - a pitch of a known frequency and speed is played on an electronic tambura and the candidate is asked to tune another tambura to the

pitch of the first one and the frequency and speed is measured again. The deviation from the earlier pitch and speed is noted. For visually impaired children auditory cues are taken to manually change the pitch and speed.

Identification of tune (Dynamic melody RAGA) – One raga will be played for a minute and then the children will be asked to identify the raga from among three raga clips of 30 seconds that followed. The raga is played without a song, to avoid cues from the song. The recording is of a flute rendering of the raga. Twenty four children (visually impaired) and thirteen normal children who had no initiation to music were taken for the study. The above tests were applied on them and the results analyzed.

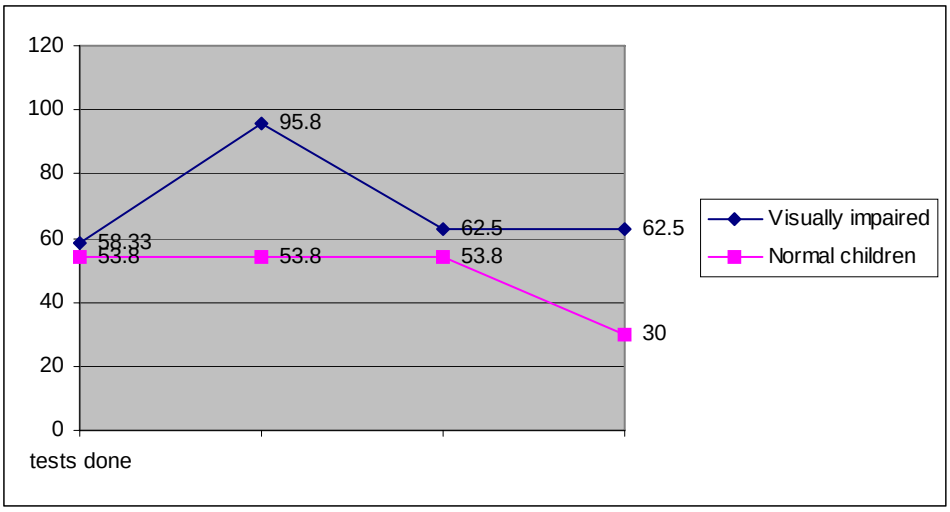
RESULTS

The visually impaired children score far better overall than normal children

42 % of visually impaired scored properly in all the categories of rhythm pitch and tune

96 % of them had good rhythmic sense

Raga identification - Only 30 % of the normal children were able to identify a tune against 62.5% in the blind category



NORMAL CHILDREN

S.No	Name	Class	Pitch	rhythm	Tuning	Tune
1	Vignesh	7th	Wrong	wrong	Correct	Correct
2	Roshan	5th	correct	correct	Wrong	Correct
3	Sudarsan	1st	correct	wrong	Correct	Wrong
4	Anirudh	1st	Wrong	wrong	Wrong	Wrong
5	Aditya	2nd	correct	wrong	Correct	Wrong
6	Bhavani	2nd	correct	wrong	Wrong	Wrong
7	Pavithra	7th	Wrong	correct	Correct	Correct
8	Sandhya	7th	correct	correct	Correct	Wrong
9	Divya	10th	correct	correct	Wrong	Wrong
10	Nishanth	5th	correct	wrong	Wrong	Wrong
11	Akila	12th	Wrong	correct	Correct	Correct
12	Swetha	11th	Wrong	correct	Wrong	Wrong
13	Sruthi	10th	Wrong	correct	Correct	Wrong
			7	7	7	4
			53.8	53.8	53.8	30

DIFFERENTLY ABLED VISUALLY IMPAIRED CHILDREN

S.No	Name	School	Class	Pitch	Rhythm	tuning	tune
1	Gnanasoundarya	Little flower	vii	Correct	Correct	correct	Wrong
2	Nandini	Little flower	v	Wrong	Correct	wrong	wrong
3	Kausalya	Little flower	v	Correct	correct	correct	wrong
4	Monisha	Little flower	v	Wrong	correct	wrong	wrong
5	Ramadevi	Little flower	vii	Correct	correct	correct	correct
6	Maheswari	Little flower	vi	Correct	correct	correct	correct
7	Thirunavukarasi	Little flower	vi	Correct	correct	correct	wrong
8	Tamilselve	Little flower	v	Correct	correct	correct	correct
9	Vani	Little flower	vi	Wrong	wrong	wrong	wrong
10	Mariamma	Little flower	v	Correct	correct	wrong	wrong
11	Sukanya	Little flower	viii	Correct	correct	correct	correct
12	Bhagavathi	Little flower	vi	Correct	correct	correct	correct
13	anuradha	Little flower	v	Correct	correct	wrong	correct
14	Jeevitha	Little flower	v	Correct	correct	correct	correct
15	Nadhia	Little flower	vii	Wrong	correct	correct	correct
16	Valarmathi	Little flower	viii	Correct	correct	correct	correct
17	Sashikala	Little flower	vii	Wrong	correct	wrong	correct
18	Parameswari	Little flower	viii	Wrong	correct	correct	correct
19	Mary	Little flower	vii	Correct	correct	correct	correct
20	Rajeswari	Little flower	iv	Correct	correct	correct	correct
21	Thebora	Little flower	v	Wrong	correct	wrong	correct
22	Manjula	Little flower	iv	Wrong	correct	correct	correct
23	Divya	Little flower	iv	Correct	correct	correct	correct
24	kavitha	Little flower	iv	Wrong	correct	correct	wrong
					14	23	15	15
					58.33	95.8	62.5	62.5
					53.8	53.8	53.8	30

We are designed, coded, it seems, to place the highest priority on being individuals, and we must do this first, at whatever cost, even if it means disability for the group." - Lewis Thomas

CORTICAL PLASTICITY

Recent research has shown that sensory-specific areas in some areas of the brain can be “recruited” or “remapped” by other sensory-specific areas whenever there is deprivation in sensation. As a result, the visual cortex in the occipital region in blind individuals has been activated during auditory inputs while the auditory cortex in deaf individuals can be activated by visual tasks.

What is interesting is that the **quality of sensation in activation of the visual cortex in the blind, or the auditory portion in congenitally deaf persons, changes according to the nature of inputs.** So, visual inputs are perceived as visual even though it is the auditory cortex that has been activated. In the case of the deaf, the auditory cues are heard as auditory even when it is the visual cortex that is stimulated. **This is the basis of plasticity of the brain**[14].

Absolute pitch in blind musicians

Absolute pitch (AP) is defined as the ability to identify a particular pitch of the Western musical scale without any external reference tone. The ability to identify Absolute pitch is present in a minority of trained Western musicians. While one out of every one thousand five hundred or one out of ten thousand in the general population have the aptitude of Absolute pitch, several studies

demonstrated that AP is more likely to develop if musical training is started early. Even among established musicians, Absolute pitch is possessed by only less than twenty percent of musicians. In a sample of 46 early blind subjects, in a study by

Roy H. Hamilton, Alvaro Pascual-Leone and Gottfried Schlaug, the researchers identified 21 who had musical training, 12 of whom (57.1%) reported having AP[15]. This shows that **the prevalence of absolute pitch in blind musicians even if they have started musical training much later, is much higher than the sighted musician group**. This suggests that **neural mechanisms underlying AP in blind musicians could differ from those in sighted musicians.**

MRI imaging

MRI studies were performed in nine blind and 10 sighted individuals and it was found that part of the core area of the auditory cortex was found to be enlarged by a factor of 1.8 in the blind compared with the sighted humans[16].

Ross[17] et al reported that a congenitally blind musician, subject ML, possessed absolute pitch abilities that corresponded similarly to those of a reference group of Absolute pitch musicians with good vision. The group then examined subject ML and five control subjects using an fMRI paradigm. A regions-of-interest analysis found that similar areas were activated in ML and the control subjects, to a similar degree, in response to music processing. However, the fMRI of the subject ML showed additional activations in left parietal association cortices and extrastriate regions of the occipital lobe. The possibility of blindness-induced plasticity being a basis for the special musical skills as well, cannot be excluded.

Enhanced reactivity to visual stimuli in deaf individuals.

There have been several studies that have reported that profoundly deaf individuals respond much faster to visual stimuli. It is thought to be due to orientation to attention orienting. Bottari[18] et al examined 11 deaf individuals and 11 hearing controls, in a simple detection task and in a shape discrimination task. **The reaction timing was much faster for the simple detection tasks in deaf than hearing controls, regardless of target location.**

The authors concluded that enhanced reactivity to visual stimuli in the deaf cannot be explained only by faster orienting of visual attention and can emerge for central as well as peripheral targets. Moreover, the persisting advantage for peripheral locations in the deaf, observed here under distributed attention, suggests that this spatially-selective effect could result from reorganized sensory processing rather than different attentional gradients.

Changes in the spatial distribution of visual attention after early deafness.

One such study proposes that deafness in childhood changes the extent of visual attention from central to peripheral field by enhancing peripheral processing. In this protocol, central and peripheral attentional resources were compared in deaf and hearing individuals. The authors concluded that deaf individuals possessed greater attentional resources in the periphery but less in the center when compared to hearing individuals. It was hypothesized that auditory deprivation from birth leads to compensatory changes within the visual system that enhance attentional processing of the peripheral visual field[19].

PROJECT 3

TRAINING CHILDREN IN THE MODELS OF VOCATIONAL REHABILITATION

Placing one foot in front of the other, I've climbed to higher lengths. Reaching beyond my own limitations, to show my inner strength. No obstacle too hard, for this warrior to overcome. I'm just a man on a mission, to prove my disability hasn't won. ~
Robert M. Hensel

MODELS OF REHABILITATION

1. **Open employment**
2. **Self-employment**
3. **Co-operatives formed by the people with disability**
4. **Sheltered workshops and supported employment**
5. **Home based Employment**
6. **Disabled in the service of the disabled.**

OPEN EMPLOYMENT

In open or competitive employment the PWD is considered equal to all in the job or company which he is employed or proficient at. He competes with the able-bodied for the allotment of jobs and other benefits like incentives. For example the auto mechanic who is employed alongside other able-bodied workers, is considered at par with the others. Sometimes there is reservation for the handicapped which ensures preferential training or job allotment, but once absorbed, the person with disability will have to be as productive as others in output and performance.

Name: Hidayathullah

Age: 21 years

Disability: Visual Impairment

Occupation: Born with visual impairment, he was found to be very much interested in Music. He is highly talented in playing the Key board (light music) and is good in singing. Has done his graduation in BA Litt in Loyola College and

is currently pursuing his higher studies in Music at the Govt. Music College . He has represented his school choir and played a lead role in all its performances and inter school competitions. **For his exceptional talent, Loyola College has appointed him as a trainer for its visually impaired students to learn keyboard**. Hidayathullah is hence a part time employee even as a student and is also getting established as a professional keyboard artist. He has trained over 100 visually challenged students in his college and also gives a minimum of twenty programs every month.

Hidayathullah playing on his keyboard

"Death is no more than passing from one room into another. But there's a difference for me, you know. Because in that other room I shall be able to see." - Helen Keller

SELF-EMPLOYMENT

In self-employment the person with disability starts a business on his own. He may be given financial assistance by banks and other funding agencies. Sometimes he does so well he employs several able bodied under him. Reservation in Self-employment can be managed by schemes of special allotment of oil pump dealerships or telephone booths.

Name: Sathyanarayana Age: 23years Disability: Visually impaired

Occupation: Student of Music – Vocal – Carnatic & Light Music

Sathyanarayana is visually impaired by birth and had done his schooling in a special school in Chennai. He had lost his mother at a very tender age and was under the care of his school. He was spotted at a talent hunt event organized by Freedom Trust in the year 2003 for his excellent aptitude and talent for Music. He was put under systematic training and after his schooling he joined the Music Academy, Chennai for his further studies in Music. He stood first in both the theory and practical streams. He is currently doing his advanced training at the Music Academy and gives a number of performances in both Carnatic Music & Light Music and also takes classes. He is a regular topper in his college and has a busy program schedule. He is a regular singer in a number of light music troupes and has sung and acted for a movie which featured characters who were all challenged in one way or the other.

Sathyanarayana rendering an invocation song at a function

CO-OPERATIVES – PARENTAL COOPERATIVES

A group of PWDs with common interests come together and provides some services, or make some products, which are marketed by them without assistance of the able-bodied. Each of these 'partners' provides the seed money, and possesses skills which complement each other. Where some of the members are children and unable to take care of the business, the parents of the children participate as if they were the members of the cooperative. The parents also take on some roles that are needed for the organization. They may function part time or full time depending on their own interest, or initiative. Whatever profits realized are shared equally among members of the co-operatives.

Name: Manasi

Age: 20 years

Disability: Hearing & speech impaired. Was identified by her parents with the disability at the age of one. She was spotted for her talent when was just three years where she would just draw any picture from a book and colour them so neatly and beautifully.

Training: She was put under training from the age of six and more seriously from the age of 10 under the tutelage of Shri. Ramasuresh who has nurtured her so well that she has currently joined Stella Maris College(Visual Arts), Chennai to pursue her passion in art.

Occupation: A highly talented artist, has bagged a number of prizes at the inter school & inter institutional levels.

Victoria Technical Intitute – Competed with normal children and got the first prize

Syndicate bank – First prize

Her mother Mrs. Srilakshmi a special educator who has been the prime moving force for Manasi, spends a lot of her time in promoting Manasi's talent. She talks to people about her daughter's exceptional talent and untiringly tries to market her paintings. Manasi has thus sold a number of paintings not only to a number of individuals and well wishers but has also sold her paintings to Corporates like Iflex Solutions.

Manasi at Darshan's Art Gallery with her paintings & her mother Srilakshmi interacting with guests

"The problems of deafness are deeper and more complex, if not more important, than those of blindness. Deafness is a much worse misfortune. For it means the loss of the most vital stimulus--the sound of the voice that brings language, sets thoughts astir and keeps us in the intellectual company of man." - Helen Keller

SHELTERED WORKSHOPS

Co-operatives are not easy to manage and run. There are many aspects like production, purchase, marketing and finance that moderately and severely disabled persons will find difficult to manage. So a group of philanthropic individuals, an existing non governmental organization [NGO] starts a business venture employing these PWD's. The persons with disability generally look after specific areas where they are skilled like production while some other crucial responsibilities like marketing and finance are taken on by the social service organization.

DARSHAN ORCHESTRA & DARSHAN ART GALLERY

CONCEPT: The artistic talents of the hearing and speech impaired and the musical talents of the visually impaired and presenting them to the public through a common platform offered by the Freedom Trust is the focus of **DARSHAN ORCHESTRA & DARSHAN ART GALLERY**. The team comprising of singers, keyboard players and drummers meet up twice every week for their practice sessions and have started performing at various functions. Five hearing & speech students are being trained in drawing and painting in the same fashion with two classes a week and their paintings have been displayed at DARSHAN ART GALLERY. Three of the artists from DARSHAN ART GALLERY have already bagged the coveted National Awards for their exceptional creativity in the years 2005 2006 & 2010.

DARSHAN ORCHESTRA – CARNATIC MUSIC


Visually impaired children performing Carnatic Music at various occasions

DARSHAN ORCHESTRA – LIGHT MUSIC


Visually impaired children performing Light Music with orchestra

DARSHAN ART GALLERY

The artists


Some of the pictures displayed at the Darshan Art Gallery

HOME BASED EMPLOYMENT

In this model of Vocational Rehabilitation, all those persons with severe disability who find it very difficult to go to their places of work, or who are too young are given an opportunity to work at home. The explosion of technology and availability of the internet has enabled even many able bodied themselves to be home bound. The person with disability remains at home and members of the society who wish to avail all his services come to him to avail all services provided. An example would be a person with poliomyelitis running a circulating library or consultancy.

Name: Suvedha

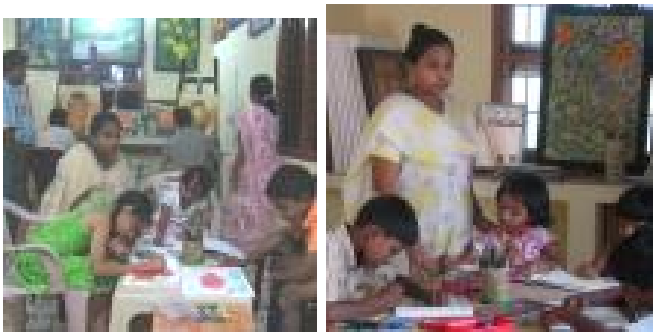
Age: 21 years

Disability: Hearing & speech impaired. Her parents realized that their child is by birth a hearing & speech child at the age of one and a half years. They put her in a special school and found in her at the age of eight that she has an abundant talent in observing things around her and just express herself through beautiful paintings.

Training: She was spotted at a talent hunt by my trust in the year 2004 and then on was put under the tutelage of Shri. Ramasuresh a well know artist in the field.

Occupation: Suvedha has now blossomed into a fine and creative artist. Has bagged the prestigious national award for her exceptional talent in drawing in the year 2010. Suvedha who is currently doing her graduation in arts already

runs a professional studio in her house and trains 12 students in drawing & painting. Apart from the coveted National Award, she has also bagged several other recognitions and prizes like Yuva Kala Bharati & Bharati Award of Excellence



Suvedha with her students at the studio

"Science may have found a cure for most evils; but it has found no remedy for the worst of them all -- the apathy of human beings." - Helen Keller

THE DIFFERENTLY ABLED IN THE SERVICE OF THE DISABLED

In this case the person with disability becomes a rehabilitation professional. He acquires a skill which makes him eligible to work for the disabled population, like a special educator or orthotist. He may be self employed as a consultant, or working in an NGO taking care of the handicapped. He or she tends to be empathetic to the cause of the disabled without bias or working purely for a wage.

OCULAR PROSTHESIS PROJECT

This is another vocational rehabilitation project for making ocular prosthesis or artificial eyes by the differently abled for the disabled. Ocularist is a person who makes artificial eyes for visually challenged people for good cosmesis. This project is a sheltered work shop for differently abled with artistic talent in making artificial eyes. The project is run by the Freedom Trust of which the author is the managing trustee.

The aim of this project is to produce ocularists by training differently abled hearing and speech impaired individuals to make artificial eyes for visually challenged individuals.

The individuals who have a blind eye is shrunken (called phthisical eye), or post removal of eyeball due to infection, injury and tumour removal of one or both eyes.

Bilaterally blind

Enucleated eye after tumour removal

Customized shell

OCULAR PROSTHESIS

Before fitting

After fitting

Class in progress

Candidate selection:

Hearing impaired children trained in art skills for the last five years are selected. This is the skill that is so needed for ocularistry, so a program to train these children in prostheses making is likely to yield excellent results and put them on a path to making a career for themselves.

If disabled people were truly heard, an explosion of knowledge of the human body and psyche would take place." – Susan Wendell

CONCLUSION

The person with disability is considered an equal and active contributor in the modern social order, and his contribution to the field of literature, statesmanship and science or the arts is second to none. Stephen Hawking, one of the greatest brains of the century and the foremost researcher of black holes is a famous professor of physics who suffers from gross motor disability due to motor neuron disease. The poet and creator of Paradise Lost, Milton was visually impaired. The great Helen Keller was visually and hearing impaired. President Roosevelt suffered from the effects of poliomyelitis and had a perennial limp. These people were second to none in their own fields.

THIS PAPER IS AN EFFORT TO RECOGNISE THE IMPORTANCE OF MAINSTREAMING AND REHABILITATING THE HANDICAPPED THROUGH SCIENTIFIC ASSESSMENT TOOLS AND USING THE EXPERTISE OF THE VOCATIONAL TEAM

REFERENCES:

1. http://www.disabled-world.com/definitions/disability-definitions.
2. Psychological Testing George Domino, Marla L. Domino - 2006 - Page 302
3. Vocational special needs Michelle Sarkees-Wircenski, John L. Scott American Technical Publishers, 1986 Pg.113 Gregory Robert J. – 2004
4.The physical capacities evaluation: its use in four models of clinical practice Susan L. Smith, Patricia Baxter-Petralia
5. Vocational rehabilitation and employment of people with disabilities – Debra Perry Senior specialist in Vocational Rehabilitation International Labor Organization.
6. Dupont Study (U.S.), Lou Harris poll (U.S.), Marriot (U.S.), Centrica (UK), Tricon Restaurants (Australia).
7. NSS 58th Round (2002), National Sample Survey Organizations
8. http://socialjustice.nic.in/pwdact1995. page 15
9. Gazette No. 1 of 1996 Government of India
10.“ The Cognitive science of art” – Dr.Viliyanur S.Ramachandran M.D Phd. Neuroscientist, San Diego California.

11. (*The Twins*, Sacks, 1986). "Inside the Mind of the Savant"by Drs. Darold A. Treffert and Daniel D. Christensen. Nadia (Selfe, 1977) and Stephen Wiltshire (1987; 1991; see also Sacks, 1995; Hermelin, 2001). See also *The Autistic Artist* in Sacks (1986).

12. The MUSIC OF LIGHT: THE EXTRAORDINARY STORY OF HIKARI AND KENZABURO OE by Lindsley Cameron (Author)
13. A Music Learning Theory for Newborn and Young Children. GIA, Chicago, 1990, 1997, 2003. Edwin Gordon14. David Howes
14. Absolute pitch in blind musicians.
Roy H Hamilton, Alvaro Pascual-Leone, Gottfried Schlaug in *NeuroReport (2004*

15Nature. 1998 Sep 17;395(6699):278-80.

Early-blind human subjects localize sound sources better than sighted subjects.

Lessard N, Paré M, Lepore F, Lassonde M.

16 Cortical plasticity in an early blind musician Ross DA, Olson IR, Gore JC. Department of Diagnostic Radiology, Yale School of Medicine, New Haven, CT, USA.
17. Bottari D, Nava E, Ley P, Pavani F.
Department of Cognitive Sciences and Education, University of Trento, Trento, Italy. J Cogn Neurosci. 2002 Jul 1;14(5):687-701.
18. Proksch J, Bavelier D. Department of Brain and Cognitive Sciences, University of Rochester, NY 14627-0268, USA.

FURTHER READING:

□Art and the Developing Consciousness Elizabeth Truswell
□Exploring musical interaction between a teacher and pupil, and her evolving musicality,...Adam Ockelford Research Studies in Music Education.2007; 28: 51-70
□: "Identifying gifted handicapped children through their drawings," ARTherapy: Journal of the American Art Therapy Association 1 (1) 40-46.
□ The role of art in the conceptual thinking, adjustment, and aptitudes of deaf and aphasic children. Doctoral dissertation, NY, Columbia University, University Microfilms (No. 66-8230)
□"Art education and the education of deaf students," Co-author, John Harrington, The Volta Review,70 (60) 475-48. Reprinted in Curriculum, cognition, and content, Washington, D.C., A.G. Bell Assn, 1968.
□ The transfer of cognition and attitudes of deaf and aphasic children through art. Springfield IL: State of Illinois Instructional Materials Center No. 62706.
□"Children with communication disorders: cognitive and artistic development," American Journal of Art Therapy, 14 (2) 39-47
□"Using art to develop cognitive skills," American Journal of Art Therapy, 16 (1) 11-19
□ "The question of Imagination, originality, and abstract thinking by deaf children," American Annals of the Deaf, 122 (3) 349-354
□ The role of art in developing and evaluating cognitive skills, Co-author Claire Lavin, PhD, Journal of Learning Disabilities, 10 (7) 416-424, ERIC ED No. EJ 171 839
Assessing and developing cognitive skills in handicapped children through art, Co-authors E. Boeve, K. Hayes, J. Itzler, C. Lavin, J O'Brien, N. Terner, & P. Wohlberg. Project No. G 79 008, supported by National Institute of Education grant, ERIC Ed No. 209878.

Quotes Courtesy:

http://www.finestquotes.com/select_quote-category-Disability-http://www.disabled-world.com/disability/disability-quotes
□http://arch-online.org/disability-quotes-famous-peoples-disability-sayings

I choose not to place "DIS", in my ability.
Robert M. Hensel

I seem to be thinking rationally again in the style that is characteristic of scientists. However, this is not entirely a matter of joy as if someone returned from physical disability to good physical health." - John Nash [NOBEL PRIZE WINNER]